

# CONSISTENCY MEETING

Date: July 2015

## DEPARTMENTAL GOALS:

- 85 - 90 % 1 DAY TURN AROUND
- 80 - 85 % CONTRACTOR PASS RATE
- **QUALITY INSPECTIONS!**
- **EXCELLENT CUSTOMER SERVICE!**

## SAFETY ISSUES:

REMEMBER COUNTY CELL PHONE POLICY, USE ALL APPROVED SAFETY EQUIPMENT ISSUED TO YOU. (i.e. HARDHAT, SAFETY GLASSES, SAFETY SHOES, PPE)

**Q: WHY ARE WE HERE? A: TO SERVE THE CUSTOMER**

1) I installed a 60 HP 480v 3phase motor on a site for a Fire Pump. Using the installation instructions I installed a 200 amp OCD with #3 cu THHN w/ a #6 EG conductors to the starter. From the starter we installed 6- #6 THHN (this is not a parallel!) and a #6 EG cu conductors to the motor connection (per the manufacturer's details!!). The inspector turned me down. Was she correct? - Rains

Per 430.250 we have 77 FLA. #3 will carry 100 amps with 75 degree lugs and is sufficient for the additional 25% for continuous duty rating of 430.22. The six leads from the starter are correct per 430.21(C). Per 695.4(2) we need to size the OCPD for locked rotor current of the pump. Per 430.251 (B) that is 435 amps. This unit however is a package unit with a magnetic trip only unit and was approved as listed. We can size the EGC based on 250.122(D) and it is a #6.

2) I had a 20 hp 480v motor, the FLA is 27 amps, and the minimum circuit ampacity is 33.75 amperes. Using MC cable, a 10/3 with ground, is compliant. The Max OCD is 70 amp inverse time breaker. The inspector failed the installation and simply stated not grounded per 250.122. What's the deal? - Barnes

#10 is rated for 35 amps per table 310.15(B) (16). Per 250.122(A) the grounding conductor never has to exceed the ungrounded conductor. What you have done complies with the code.

3) What is the proper method to apply temperature derating factors to conduits installed on 4" blocking ran on top of the roof. - Mullis

Per 310.15 the conductor ampacities have to be adjusted per ambient temperatures including the sunlight and the reflective properties of the roofing (310.15(B)(3)(c) ). Additionally the conductors may have to be adjusted for more than 3 conductors in a raceway ( 310.15(B)(3)(a) ). For the 3 1/2" noted you we need to add 22 degrees Celsius. Per ASHRAE our summer cooling design ambient is 93 degrees F.

4) I have been grounding CSST piping at the manifold located in the attic area for years, now I have an inspector that failed it for not being at the meter, when will you guys get consistent, this costs me money and nobody else fails me for it! -West

NC Fuel Gas requires bonding where the service enters the building. #6 is the minimum size bonding conductor required.

5) I have a service fed with 500 kcmil aluminum. I stripped out the neutral conductor and bonded the

CT can. The inspector turned me down, referring to article 250.102 saying the bond jumper has to be copper, does this mean I also have to use a copper lug to attach it to the can? If not why? The aluminum lug would also be considered corrosive.- Simpson

250.102 additionally states “or corrosion resistant material”. The inspector appears to need training.

6) Is a separate permit required for a saw service relocation on the same lot? - Hartman

Yes. Once we approve the first time our permit duty is fulfilled. The next time we need a permit for the relocated service to cover the new admin. work and inspection fee.

7) Do we accept the AFC rating and date, being uploaded to the permit, without being labeled on the service equipment? - Dellinger

No, we must meet the requirements of 110.24.

8) When changing-out a panel, in an existing house, and running Romex to j-boxes connected to the existing circuitry, is the current code requirement for AFCI protection required? - Rains

Yes per 210.12(B).

9) Is Carlon flex approved for protection against physical damage, when circuits come up from underground on the outside of a building, or in a wall for floor heat? - Barnes

Per 356.12 Carlon cannot be subjected to damage. So, no for underground exterior.

Per 424.44(E) NM Flex is not on the list. We have allowed it for the wall/floor heat sleeve. Be sure to review and comply with the manufacturer's installation instructions.

10) I installed a wall sconce in a stairway. The inspector turned me down for the wall sconce being too low. There's nothing in the electrical code telling me what height you have to install a fixture in a stairway. Was he correct? - West

The building code gives a minimum height of 6'8" clearance in stairwells per R311.7.

11) Is a sign circuit required for a church or daycare center? - Simpson

600.5 (A) requires a circuit for commercial buildings/occupancies.

12) I'm wiring some apartments that have multiple feeders going up to each floor that feeds meter load centers. The inspector turned me down on the final for not marking these load centers as to where the power supply originates. Was he correct? - Hartman

Yes per 408.4(B).

13) If I install isolated ground receptacles, are they required to have an isolated ground all the way back to the service or separately derived system? These receptacles are grounded with an equipment ground conductor. - Dellinger

Yes. If not there is no isolation. See 250.146(D)

and 406.3(D) (1)

14) I roughed a house and wired for receptacles within 6' of the fireplace. When I came back for the trim, there were cabinets installed to the sides of the fireplace. Now the first wall receptacle from the edge of the fireplace is more than 6'? Will the receptacles that ended up inside the cabinets count as being part of the wall spacing? - Rains

NO! See 210.52.

15) I have a garage with 9 steps up to the house entry. There is a switch at the top, but no switch at the bottom. Is it not code to have switches at top and bottom of my stairs? - Mullis

Yes, see 210.70 (A) (2) (c).

16) If I have CATV cable installed in my house, am I still required to have a Cat 5 or similar cable installed for a phone line? - Barnes

Per 800.156 we need a communication outlet. Type is unspecified.

17) I have installed a PVC conduit run 6" below grade and strapped per code against the wall of the house. I was turned down for not meeting the burial depths of NEC table 300.5. This has been acceptable in the past. Has there been a change? - West

Our policy has been that this installation is allowed since it is strapped to the house for protection. If it was 1" above grade would you have an issue?

18) What is the maximum length of unfused cable allowed inside a building? - Mullis

**SUBJECT: Unfused Service Conductors**

**CODE REFERENCE: 230.70 (A) 1 & 230.91**

**SUBMITTED BY: Electrical Department**

**EFFECTIVE DATE: Immediately**

**PROBLEM: The length of unfused conductors permitted to run inside a service trough inside a commercial / industrial building**

**SOLUTION: For all commercial / industrial projects the length of unfused conductors permitted to be run inside to a service trough shall not exceed 16**



feet from the point of entry into the building to the point of termination to its overcurrent protection, where located in an electrical equipment room.

Per NCDOL;

NORTH CAROLINA DEPARTMENT OF INSURANCE  
ENGINEERING DIVISION  
STATEMENT ON SECTION 230-70(a)

The Engineering Division of the Department of Insurance states its position relative to 230-70(a) NEC as follows:

"Service entrance conductors routed from their point of entrance into the structure, to their point of attachment to the service enclosure a distance horizontally not more than twice the nominal width of the service enclosure and vertically not more than the greater of 5 feet or twice the nominal height of the service enclosure shall be considered to be in compliance with the requirements of 230-70(a) of the current National Electrical Code. Service entrance conductors may be routed in the most direct route or at right angles. Service entrance conductors in excess of these specified limits will not be allowed unless specifically authorized by special permission from the electrical inspector having jurisdiction to accommodate adverse site conditions which would not reasonably allow installation within this criteria."

By stating such interpretation, it is specifically not the intent of this Division to encourage the utilization of excessive lengths of service conductors when more direct routes are otherwise available; nor, to discourage local jurisdictions from allowing lengths beyond those specified when reasonable prudence and judgment would indicate reasonable necessity to accommodate safety or adverse site conditions. This Division will however render Code interpretations pertaining to 230-70(a) within these constraints and refer requests for special permission exclusively to the electrical inspector having jurisdiction.

**Remember that if multiple service disconnects are used they must follow these rules and be contiguous.**

19) I was turned down on a rough inspection for installing NM cable in a building that wasn't "dried in". This has been allowed in several locations we have worked in. I provided letters from the manufacturer stating that it is acceptable to do this. What's the reason for this turn down. - Barnes

Per Ron Chilton's email;

We have not permitted Type NM Cable to be installed in buildings prior to being "dried in" or the roof finished, to at least protect everything not approved for a wet location from getting wet. In reviewing the emails you sent one mentioned the open ends of NM Cable being exposed and allowing water to wick into the paper wrap surrounding the equipment grounding conductor. I don't know which cable manufacturer has stated there is not a problem but that is exactly the reason other manufacturers don't support reusing NM Cable that

has been submerged by a flood, due to the water that may be wicked into the cable jacket. The conductors used in Type NM Cable are not “wet location” and intended for dry location only installations.

20) Am I required to provide AFCI protection for a 120 volt 20 amp circuit serving baseboard heating? - Simpson

Yes, see 210.12

21) What type of "identification" is required for the boxes etc... Per 700.10(A)? - Hartman

Permanent!

22) Do I have to install bushings or grommets in metal framing where the mc cable or data cables pass through? - Dellinger

Normally yes on data and no on MC. See if any applies 300.4, 800.24, and 330.17.

23) I installed a 480 volt circuit (using EMT with an equipment grounding conductor) from a panel to a

disconnect. The disconnect had a concentric knock out. The inspector made me install a bonding bushing. This was not a patient care area and I made my own hole in the panel. Was she correct? – Barnes

No. This would not require any bonding except for the raceway and the shoulder connection would be sufficient.

24) Can I install fiber optic cable in the same raceway that contains power limited fire alarm cables? - West

Maybe. See 770.133(C), as specified.